

April 24, 2017

Eric P. Smith

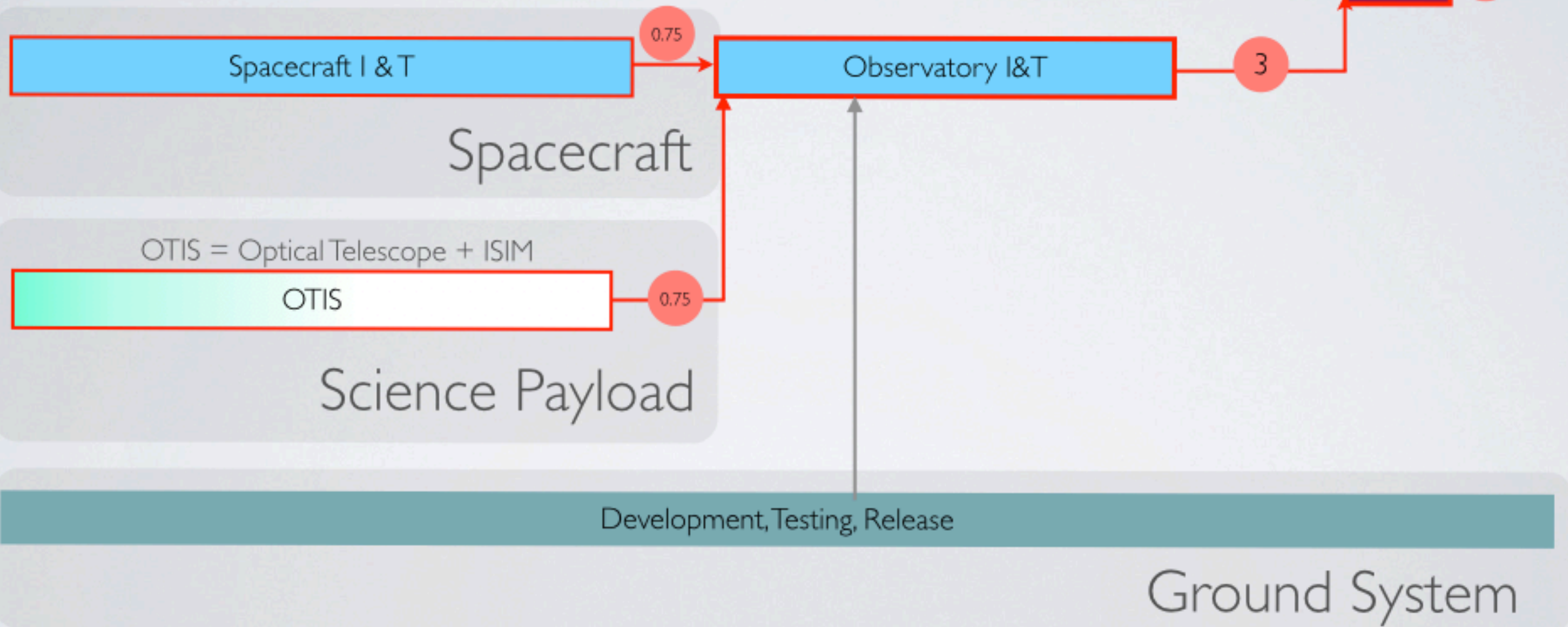
JWST Program Director/Program Scientist








# SIMPLIFIED SCHEDULE

2017												2018											
J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D

**k** months of project funded critical path (mission pacing) schedule reserve



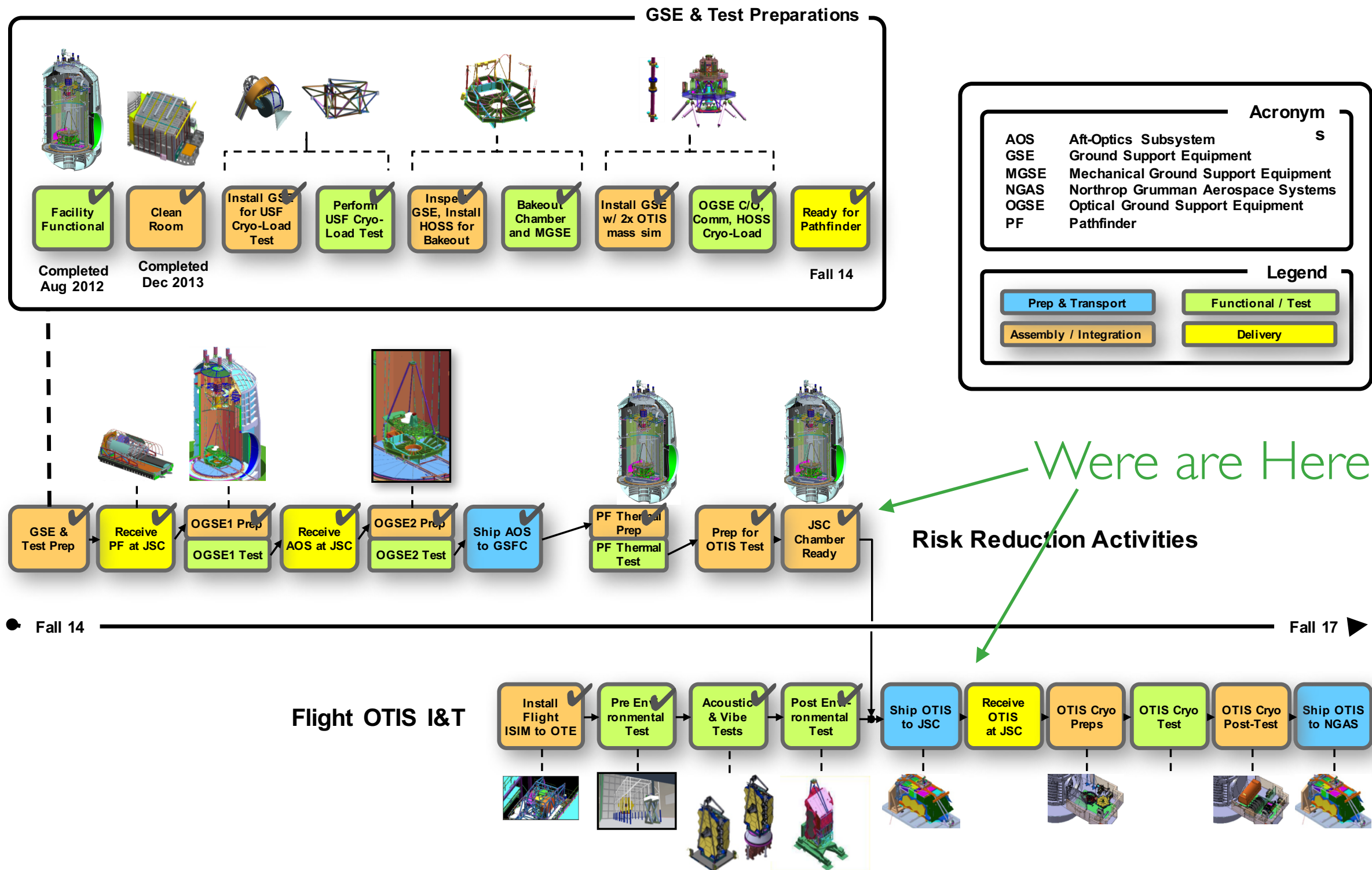
	Northrop-Grumman		Johnson Space Center		Space Telescope Science Institute
	Goddard Space Flight Center		Guiana Space Center		

# OTIS

Will have latest GSFC clean room image here



# OTIS SCHEDULE FLOW





# SPACECRAFT

- Spacecraft and sunshield integration underway
- All components delivered except deployable radiator shields and actuators (not planned for delivery yet anyway)



Second sunshield mid-boom installation



UPS ready for installation onto spacecraft



# HQ WATCH LIST

- FY 17 budget reserves
  - FY17 is a year of significant integration and test activities, where UFE likely to be needed to address any issues
  - Northrop-Grumman Aerospace Systems workforce remains high, now beginning to decrease
- 4.75 months funded critical path schedule reserve
  - No critical path schedule reserve used in the past month
  - Critical path goes through spacecraft and OTIS work flows
  - Residual liens on OTIS and spacecraft work, schedule reserve control board meeting this month
- $\frac{3}{4}$  inch Non-Explosive Actuator (NEA) – qualification (qual units passed exported shock tests)



# Fiscal Year 2017 JWST HQ Milestones

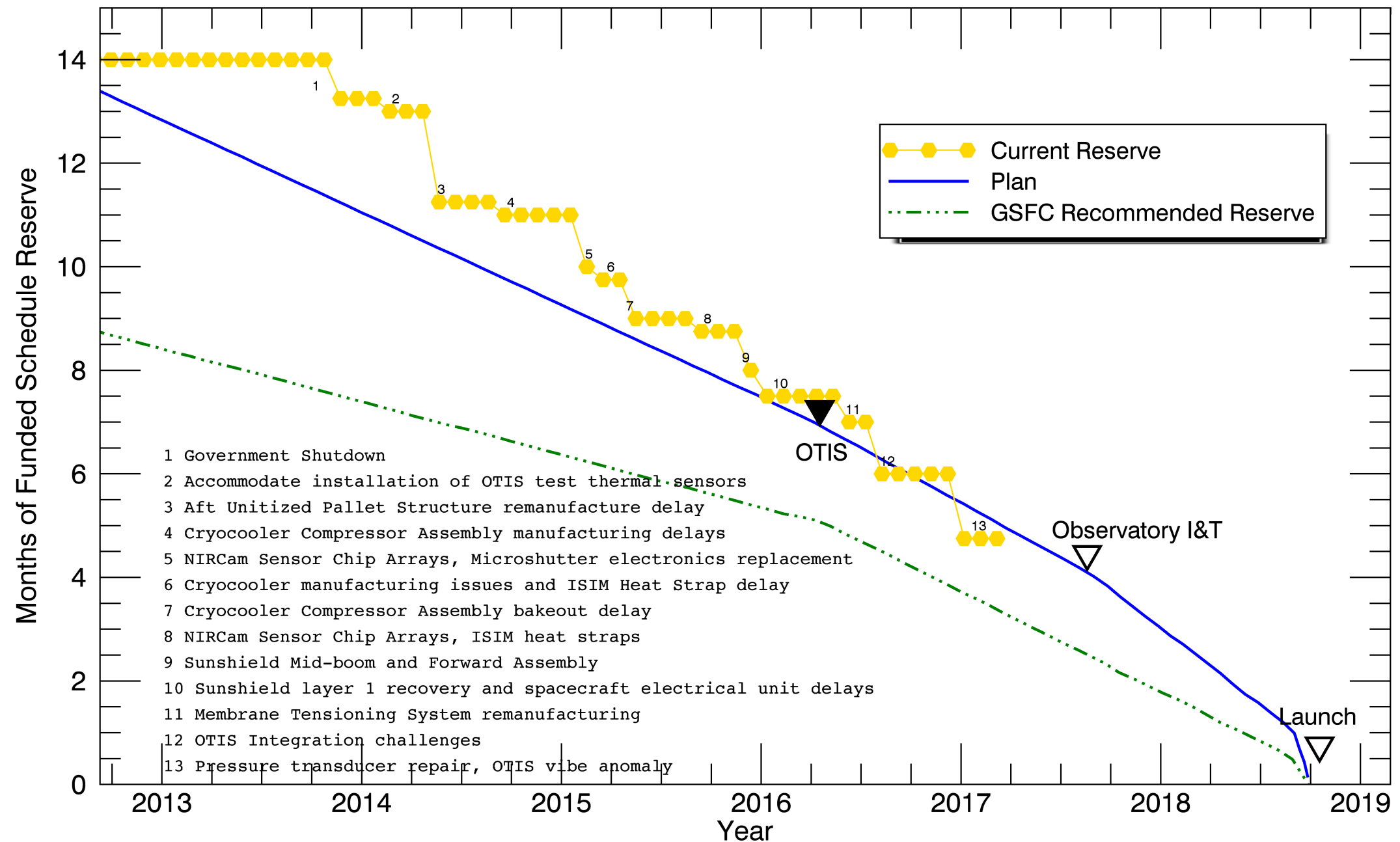
Month	Milestone	FY2016 Deferral	Comment
Oct-16	1 Complete portable clean room for Telescope and Science Instruments (OTIS)		<u>Completed 10/13/16</u>
	2 Complete final checkout of new shaker tables at Goddard Space Flight Center	•	<u>Completed 10/13/16</u>
	3 Begin making electrical connections between spacecraft panels		<u>Completed 10/7/16</u>
	4 Complete Sunshield Mid-Boom Assembly #2 functional test	•	<u>Completed 12/5/16</u>
Nov-16	5 Start optical measurements of OTIS prior to vibration and acoustic tests		<u>Completed 10/24/16</u>
	6 Deliver Science and Operations Center release 1		<u>Completed 9/30/16</u>
	7 Perform Cryocooler installation into the spacecraft bus and begin functional testing		<u>Completed 10/29/16</u>
	8 Complete Aft Unitized Pallet Structure assembly	•	<u>Completed 10/29/16</u>
	9 Deliver Aft Unitized Pallet Structure to Observatory I&T	•	<u>Completed 3/14/17</u>
Dec-16	10 Deliver Forward Sunshield Pallet Structure to Observatory Integration and Test (I&T)	•	<u>Completed 3/28/17</u>
	11 Start OTIS vibration and acoustic testing program		<u>Completed 11/19/16</u>
	12 Complete final test of engineering model of telescope center section at Johnson Space Center (JSC)		<u>Completed 10/31/16</u>
	13 Deliver sunshield flight membranes to Observatory I&T		<u>Completed 12/15/16</u>
Jan-17	14 Complete OTIS vibration and acoustics testing		<u>Completed 3/2/17</u>
	15 Deliver observing proposal and planning subsystem software build that supports launch		<u>Completed 1/12/17</u>
	16 Complete electrical testing of the spacecraft at Northrop-Grumman		<u>Completed 3/7/17</u>
Feb-17	17 Complete OTIS optical measurements after vibration and acoustic tests		<u>Completed 3/31/17</u>
	18 Deliver wavefront and control software that supports launch (controls telescope mirror shape)		<u>Completed 1/20/17</u>
	19 Deliver horizontal deployable radiators to Observatory I&T		<u>Delayed April for rework</u>
Mar-17	20 Deliver OTIS to the Johnson Space Center		<u>Delayed to May due to OTIS vibration investigation</u>
	21 Deliver the pre-launch Flight Operations System software build		<u>Completed 2/17/17</u>
	22 Delivery of sunshield extension boom #2 membrane attachment assembly to Observatory I&T		<u>Completed 4/13/17</u>
Blue font( <u>underline</u> ) denotes milestones accomplished ahead of schedule, orange font denotes milestones accomplished late. "*" denotes 2016 milestones carried forward.			

# Fiscal Year 2017 JWST HQ Milestones

Month	Milestone	FY2016 Deferral	Comment
Apr-17	23 Conduct first test of the Ground System (communications and data handling) 24 Install the deployable horizontal radiators onto the Observatory 25 Conduct the Observatory Deployment Review #2		Delayed to July due to propellant system re-welding Delayed to July due to propellant system re-welding Delayed to <u>May</u> , mid-boom 1 deployer issue
May-17	26 Complete room temperature integration of OTIS and test equipment at JSC 27 Conduct the Mission Operations Review 28 Perform Spacecraft Acoustic Testing		Delayed to June due to OTIS vibration investigation <u>Completed 4/7/17</u> Delayed to July for propellant system re-welding
Jun-17	29 Start OTIS thermal vacuum test At JSC Chamber A 30 Deliver Operations Scripts Subsystem software build that supports launch 31 Issue final release of call for proposals for Early Release Science Programs 32 Begin spacecraft thermal vacuum test		Delayed to July due to post environmental testing  Delayed to September for propellant system re-welding
Jul-17	33 Deliver vibration test results to support the combined analysis of the rocket and the observatory 34 Conduct second Flight Operations Team Operational Readiness Exercise		Delayed to August due to propellant system re-welding
Aug-17	35 Tension sunshield membranes while they are mounted on the spacecraft 36 Deliver final report describing spacecraft influence on observatory optical alignment		Delayed to November for solar array simulator issue
Sep-17	37 Complete OTIS thermal vacuum test 38 Deliver the results of the combined analysis of the rocket and the observatory		Delayed to October due to post environmental testing
Blue font( <u>underline</u> ) denotes milestones accomplished ahead of schedule, orange font denotes milestones accomplished late. "*" denotes 2016 milestones carried forward.			



# FUNDED SCHEDULE RESERVE



# SCIENCE & OPERATIONS CENTER

- Successfully completed the Missions Operations Review (MOR: April 4-7, 2017)
- Review team had no issues to report
- Strengths
  - The ground and operations are beyond MOR maturity
  - Commissioning phase is well thought-out and thorough
  - Very strong team
  - Training and rehearsals plan is very thorough and well thought-out
  - Extensive heritage from HST in science and ground operations
- Four Concerns identified
  - Long duration of commissioning raises concern over personnel exhaustion and burnout, availability of subject matter experts during critical deployments, fault management relies on Attitude Control System side B, but this is not tested on-orbit, risk management system for ground appears to need attention



# S&OC SUBSYSTEMS

S&OC & Subsystem Status						
Subsystem	Build	Development completion date	I&T completion date	Status	% of requirements delivered to date	% of requirements verified to date
Data Management Subsystem (DMS)	5	October 2015	May 2016	I&T completed	89%	65%
	6	May 2016	December 2016	I&T Completed		
	7*	December 2016	April 2017	In I&T		
	7.1	November 2017	February 2018	In Development		
Proposal Planning Subsystem (PPS)	12	October 2015	April 2016	I&T completed	97%	81%
	13	April 2016	December 2016	I&T Completed		
	14*	December 2016	April 2017	In I&T		
	14.1	January 2017	June 2017	In Development		
Wavefront Sensing & Control (WFS&C) Software Subsystem	5.1	March 2016	May 2016	All requirements completed	100%	100%
	6*	January 2017	May 2017	In I&T		
	6.1	December 2017	February 2018	Planned		
Flight Operations Subsystem (FOS)	5	March 2016	July 2016	I&T completed	83%	48%
	6	February 2017	July 2017	In Development		
	6.1*	August 2017	December 2017	In Development		
Operations Scripts Subsystem (OSS)	5	May 2016		Level 2 certification testing completed	73% Level 2 certified	58% Level 3 certified
	6*	March 2017	August 2017	In Development		
Project Reference Database Subsystem (PRDS)	4.12*	July 2016	July 2016	Latest Sustaining Engineering release	100%	100%

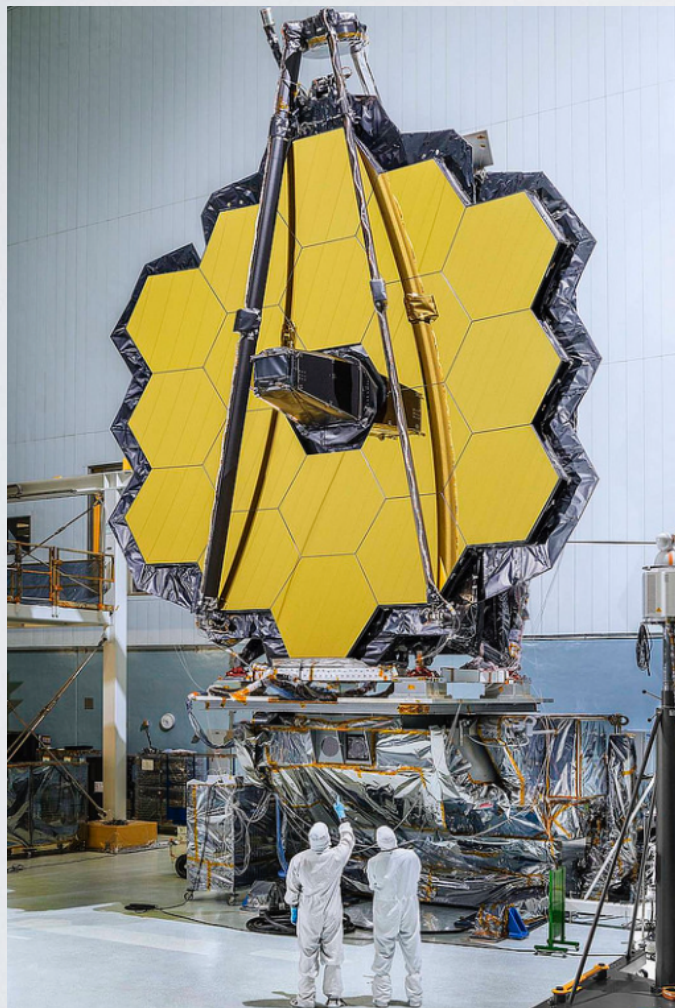
\*Flight Build



# THE JWST TESTING PROGRAM

How do we check that the telescope we design...

will result in this?



+



=





# WHY WE TEST

- NASA missions push the boundaries of industry and government technical capabilities
  - New technologies need to be verified before launch
  - Extreme environment of space provides a unique challenge for spacecraft and instrument designers
- Testing and Verification serve to demonstrate that our missions will meet their objectives with an acceptable level of risk – no NASA mission is 100% guaranteed
  - More new technology involved = more testing required
  - More extreme the mission environment = more testing required
  - Number of tests increases with time as the agency applies lessons learned from previous missions too (e.g., OTIS test in part from HST legacy)



# WEBB HARDWARE VERIFICATION DOMAINS

- Optics – Do the mirrors and instruments work?
- Deployments – Will the observatory open as planned?
- Cryogenics – Can we achieve the needed sensitivity?
- Launch – Can we survive our ride to space?
- Commissioning – Are we ready to begin the science mission?

# MUST VERIFY THE OPTICS...

- Return Good Images

- Using Segmented Optics

- All elements must have combined Wave Front Error of 150 nm (diff. lim. @ 2  $\mu$ m)
    - Surface figure accurate to the width of a bacterium

- Control of optics via actuators

- Avoid the Hubble Problem

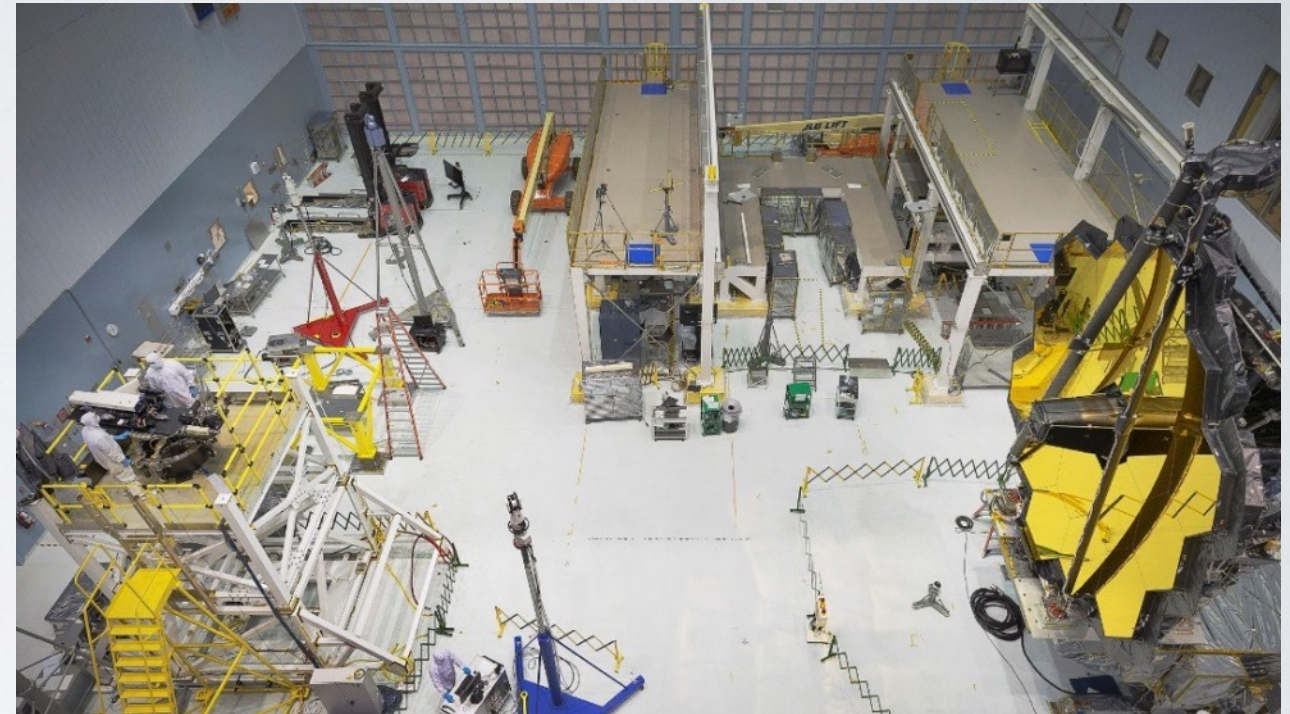
- Telescope cryo test

- Are Big Enough to See the First Stars and Galaxies

- Largest space telescope ever built

- Are Super Clean

- Exposed Optics
  - H<sub>2</sub>O is a contaminant for JWST! (A mere 1 oz. of water ice spread over the aft sunshield will interfere with mid-infrared observations)

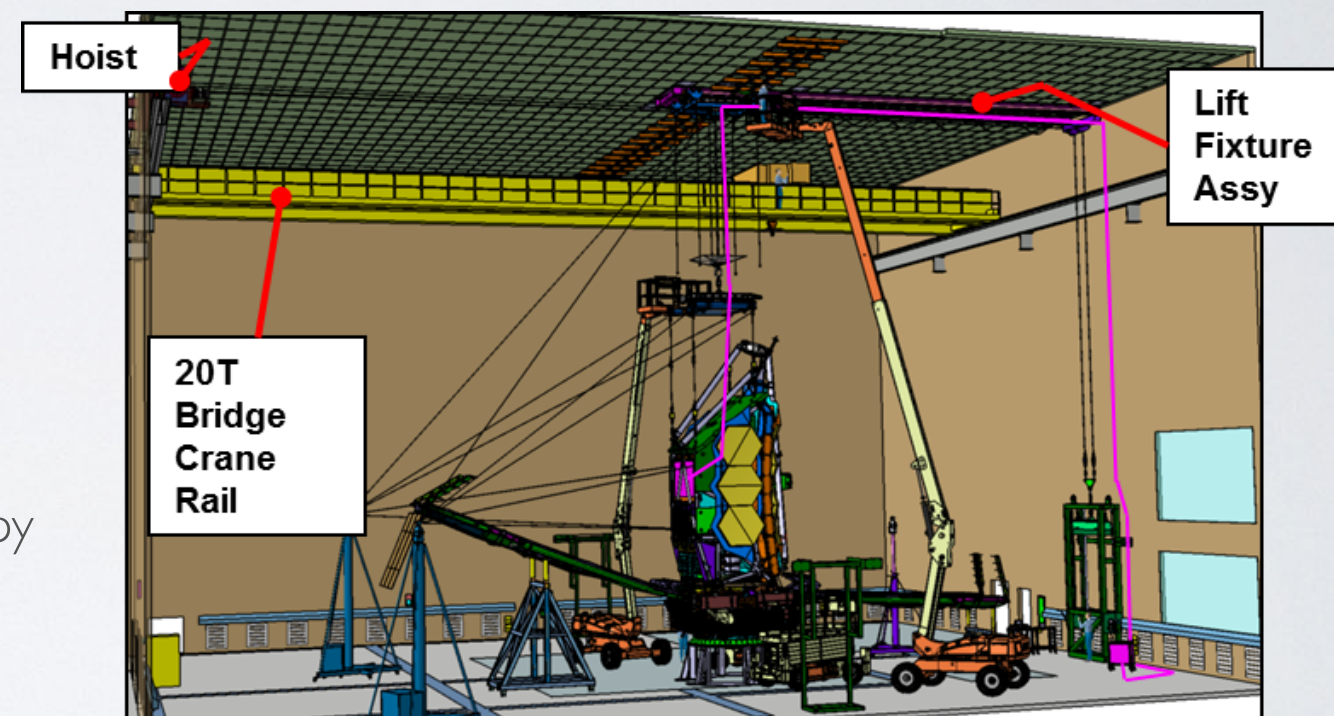


JWST mirror being tested at GSFC



# MUST VERIFY DEPLOYMENTS...

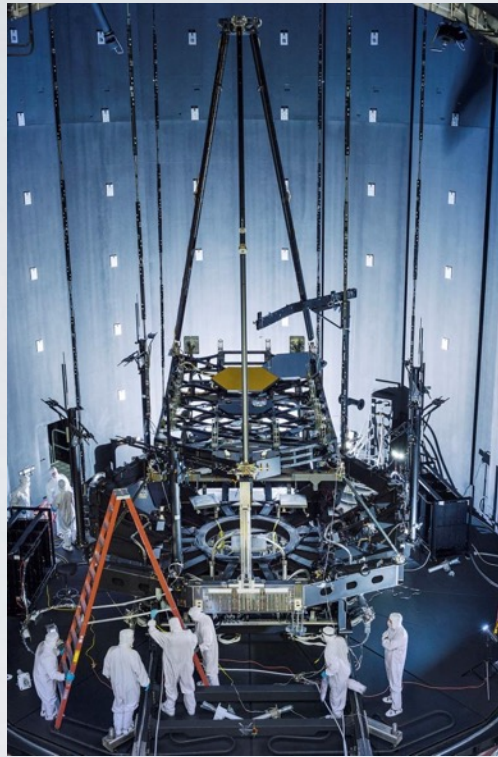
- All work
  - All spacecraft have deployments (e.g. solar panels, antennae)
  - Because of its size, JWST has over 300 deployments (counting mechanisms in a similar way, the Mars Curiosity mission had about 70 deployments)
- Work in zero-gravity
  - Mechanisms must work in zero gravity, but must be tested in Earth's gravity requiring often complex off-loading machinery to “counter” the acceleration felt by part when tested on the ground
- Work in extreme cold temperatures
  - Some parts must move while extremely cold – How would you uncoil a garden hose when it's frozen?
- Can Survive Launch
  - These mechanisms parts must be strong to withstand the vibrations and sound waves from the launch, yet moveable or in some cases separable for deployment.



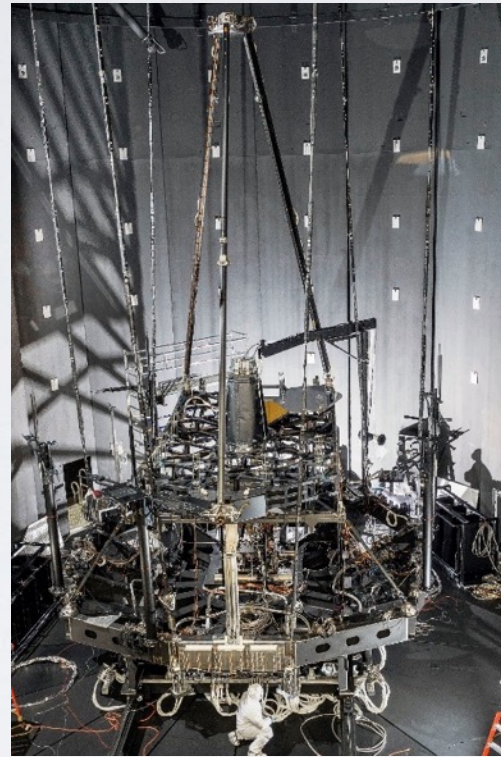
Deployment rigging at Northrop-Grumman



# CRYOGENIC TESTING STEPS



Pathfinder test 1

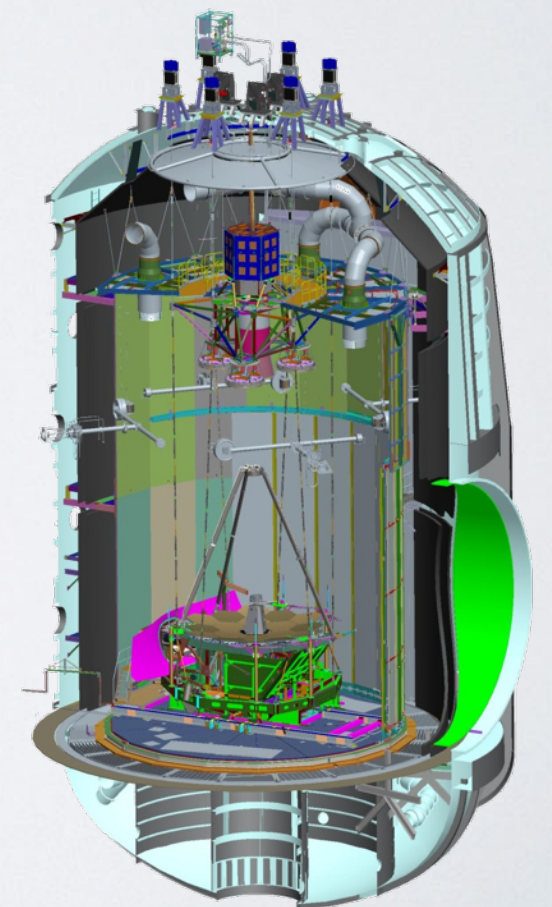


Pathfinder test 2  
Aft Optics Installed



Pathfinder test 3  
Thermal hardware installed

Model of full telescope in chamber for cryogenic test

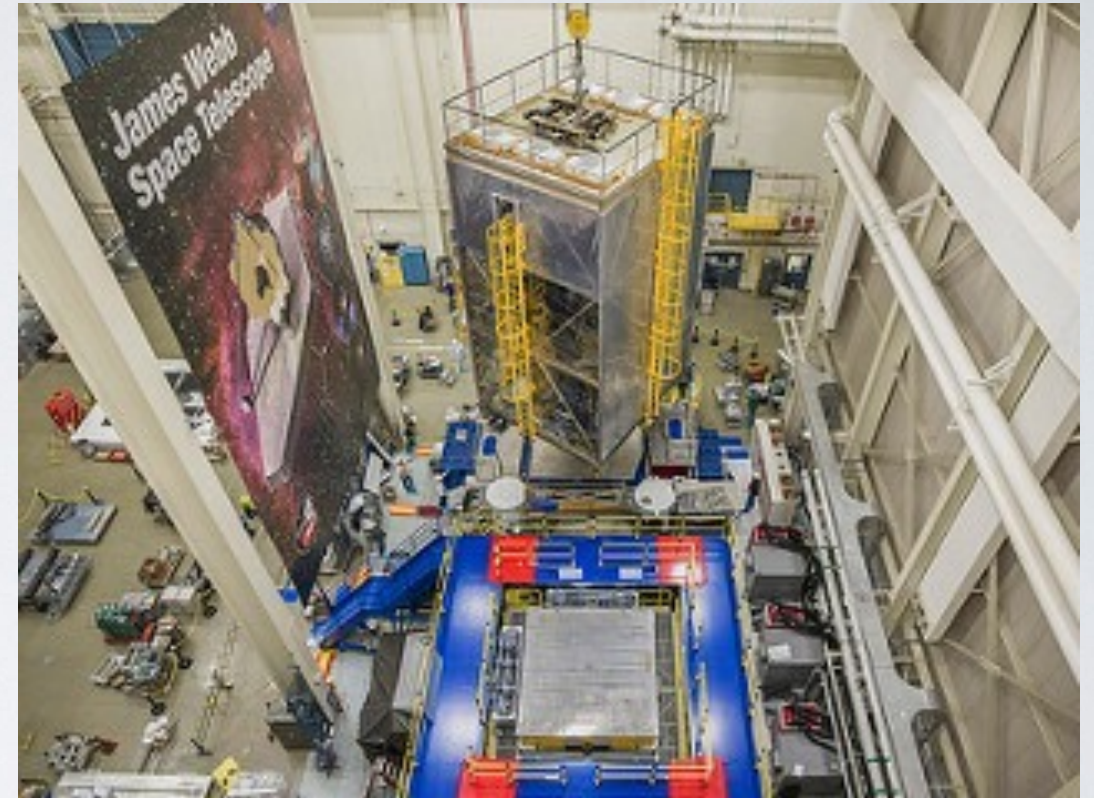




# MUST VERIFY LAUNCH SURVIVAL...

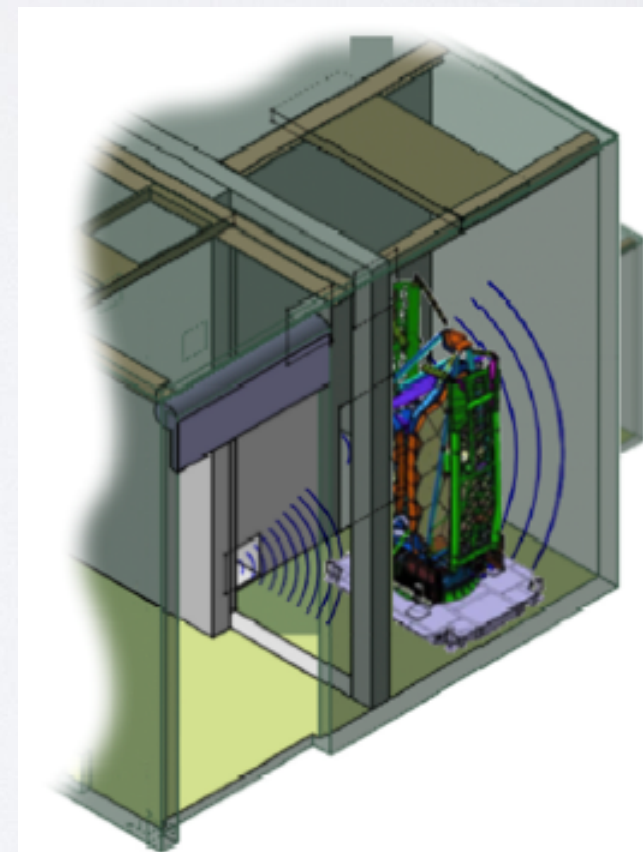
- By Vibration Testing

- Size – largest payload ever vibration-tested at GSFC
- Load Carrying deployments – key areas of the payload must carry large stress yet deploy after launch



- By Acoustics Testing

- Payload is blasted with the sound of launch
- All structures including very thin ones (e.g., sunshield membranes, microshutters) must survive



Observatory at Vibration  
Tables

Observatory in Large  
Acoustic Test Facility

# JWST PRE-LAUNCH HARDWARE TESTS

- ✓ Telescope Vibration (3 axes)
- ✓ Telescope Acoustics
- ✓ Telescope Deployment (7 different deployments)
  - Telescope Cryogenics (93 day cryo-vacuum test)
- ✓ Spacecraft Electrical test
  - Spacecraft Thermal Vacuum test
  - Spacecraft Deployment (7 tests)
  - Observatory Vibration (3 axes)
  - Observatory Acoustics
  - Observatory Deployment (all deployments retested)

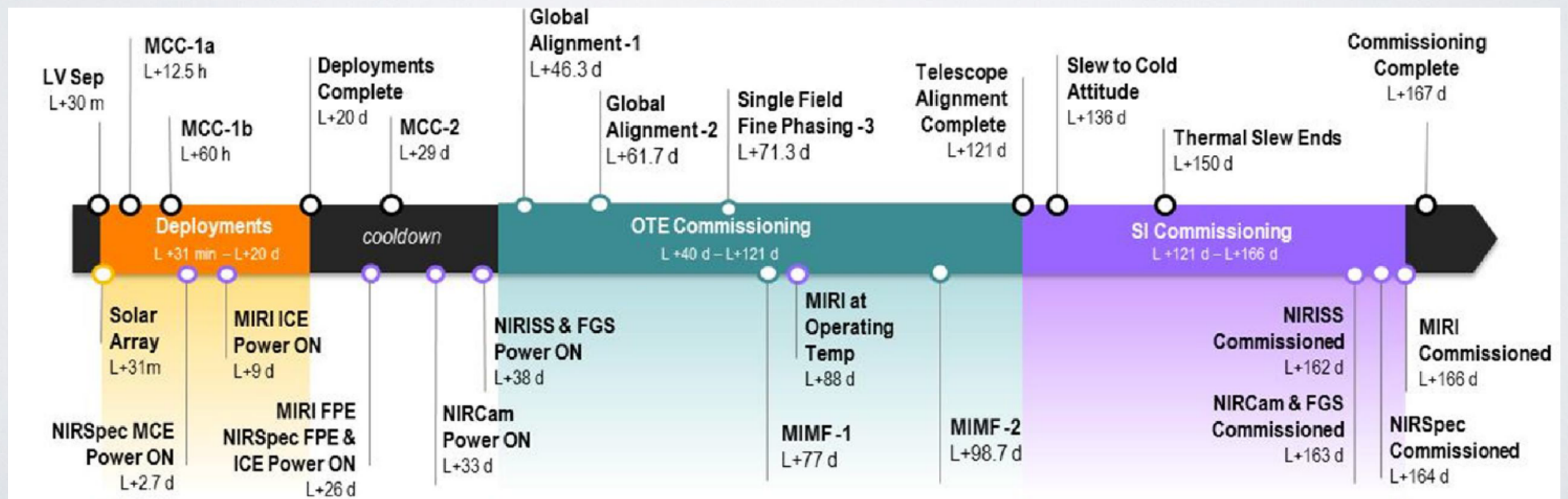


# COMMISSIONING IN SPACE

- Observatory, Telescope, Science Instrument operability demonstrated and calibrated
- JWST's many moving parts and operational modes demand a lengthy commissioning period (6 months)
  - Some functions cannot occur until the the telescope is very cold (~ 40 days after launch)
- Product of commissioning is a scientific facility ready to execute the planned observing program solicited from the science community

# COMMISSIONING TIMELINE

- Soon after launch the spacecraft is controlled from the Mission Operations Center at STScI
- OTE commissioning will take almost 3 months
- Commissioning of the science instruments will start 4 months after launch and is completed in 1.5 months.
- 0.5 months are held on reserve to the nominal start of Cycle 1 science in April 2019





# SUMMARY

- Program remains within replan budget and on time for October 2018 launch readiness date
- Project is well into integration & test. There are and will be many new, first time challenges associated with this phase
- STScl is making excellent progress at preparations for launch and operations. Community engagement has begun with the Early Release Science call for Notices of Intent and the receipt of the Cycle 1 Guaranteed Time Observers detailed proposals.



# JAMES WEBB SPACE TELESCOPE

## Science and Operations Center (S&OC) Update



Nikole K. Lewis  
STScI JWST Project Scientist  
2017 April 24



# STScI Operations Flow

Proposal Preparation

PPS

Proposal Selection

Science Planning

Operations Scheduling

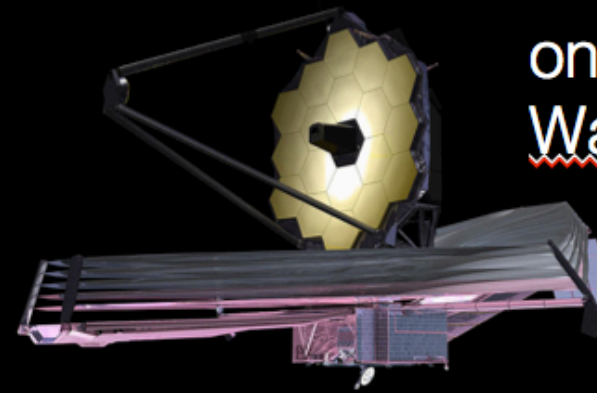
Flight Operations

FOS

Data Processing and User Tools

DMS

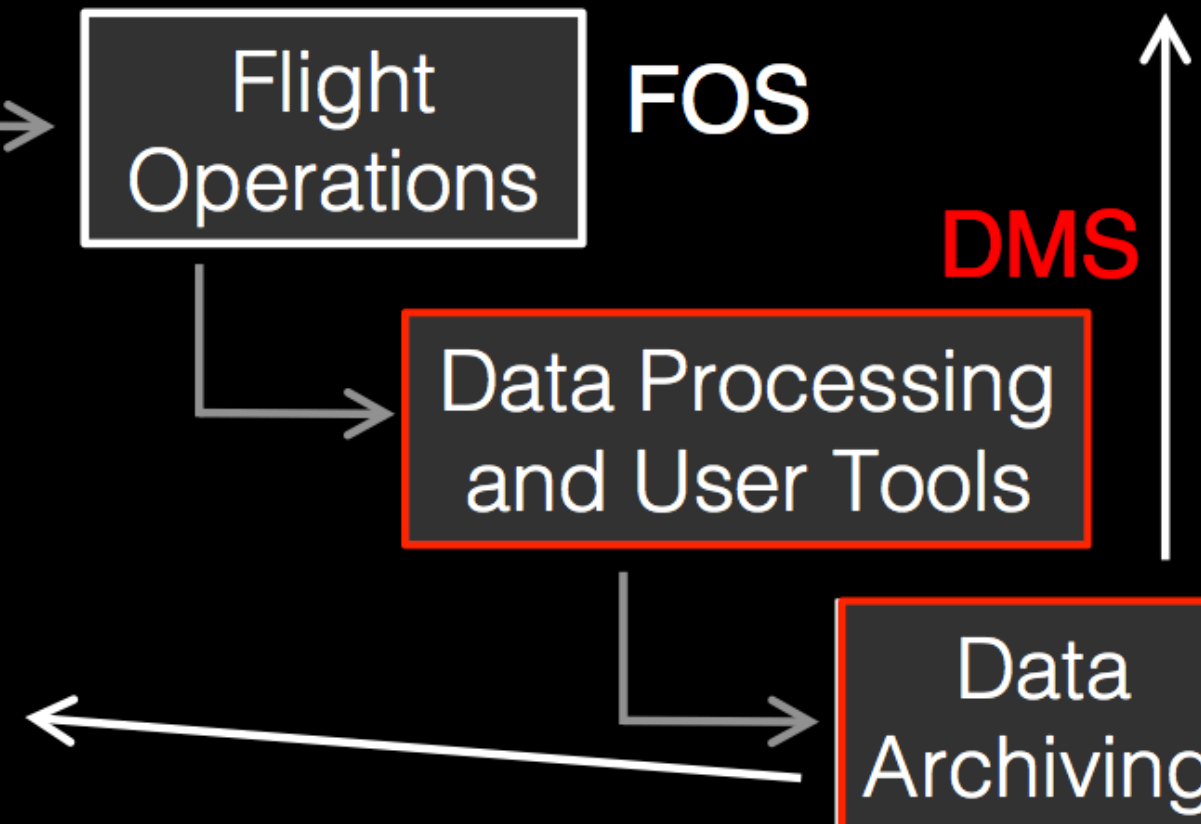
Data Archiving



on-board scripts (OSS)  
Wavefront sensing (WFSC)



Science Community and Public Outreach





# Recent Key JWST S&OC Events

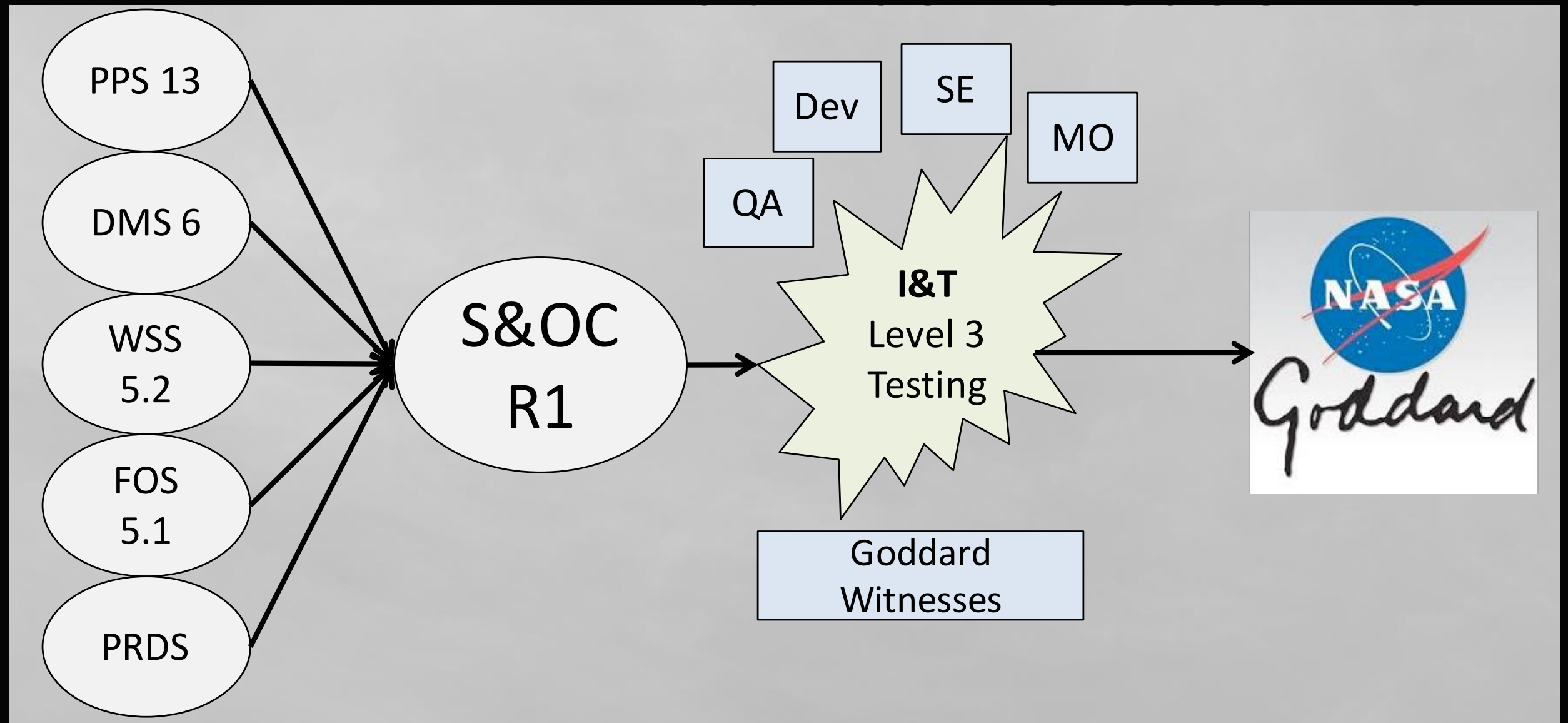
- S&OC Release 1 Verified and Delivered, on track for timely delivery of flight build.
- First End-to-End Test of the Observatory Test Bed Simulator at STScI.
- Release of Suite of Proposal Tools at Winter 2017 AAS meeting.
- JWST Cycle 1 Science Programs Solicited (GTO and DD ERS) and Preliminary Descriptions Received.



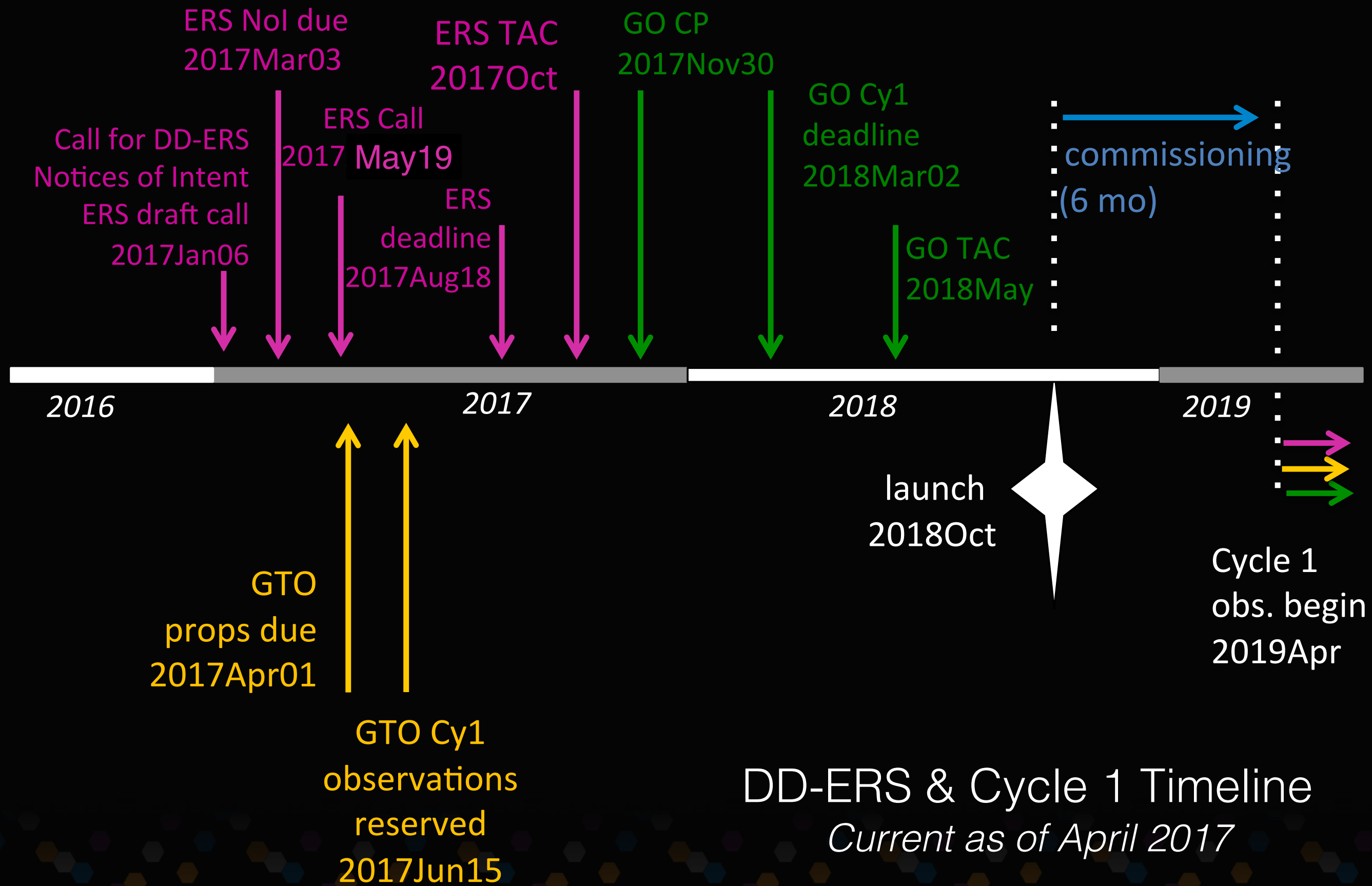
JWST MOC



# S&OC Release 1



Recent End-to-End Test with OTB Simulator  
Approaching Readiness for JWST Launch,  
Commissioning and Cycle 1 Science





# JWST@229th AAS

**JWST Town Hall**  
**January 5, 6.30-8.00pm**



**JWST User Tools and  
Calls for Proposals/  
NOIs Released!**

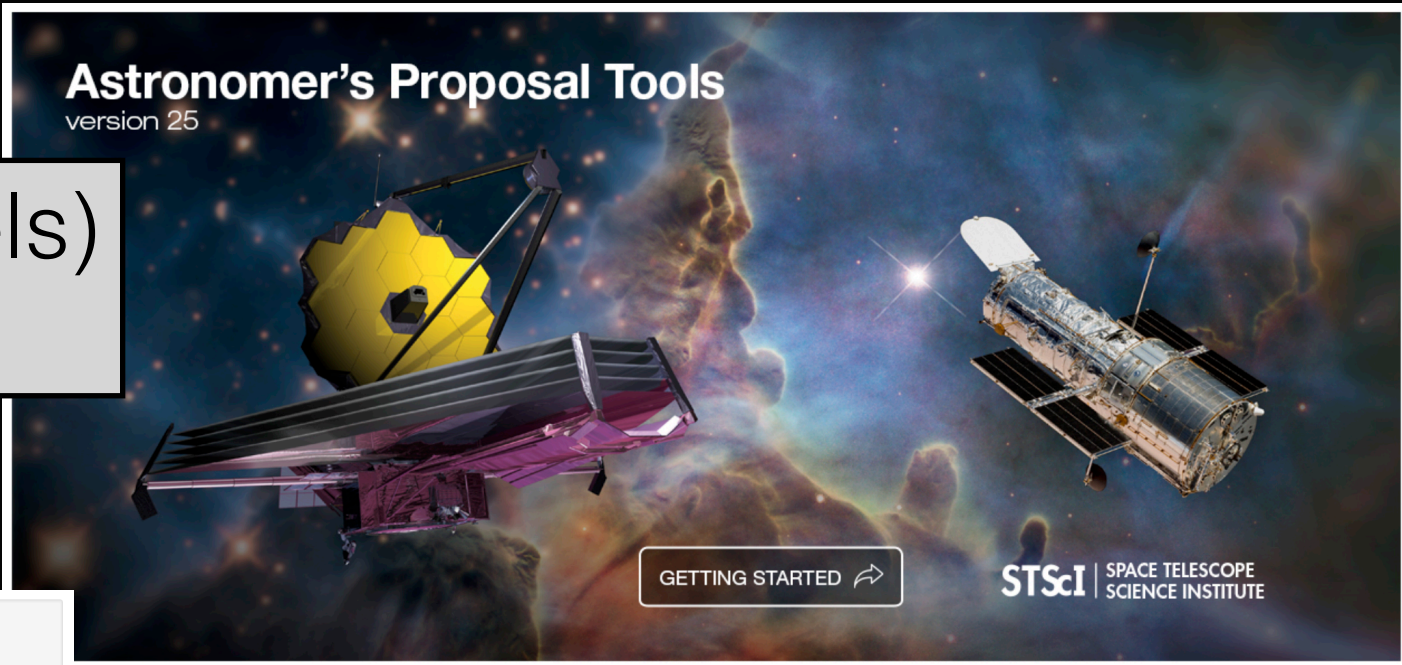
**Data Analysis Workshop**  
**January 3**



**Ask-an-Expert at the  
STScI Booth**

# User Tool Releases

APT 25.0.5 (Includes Parallels)  
<http://apt.stsci.edu>

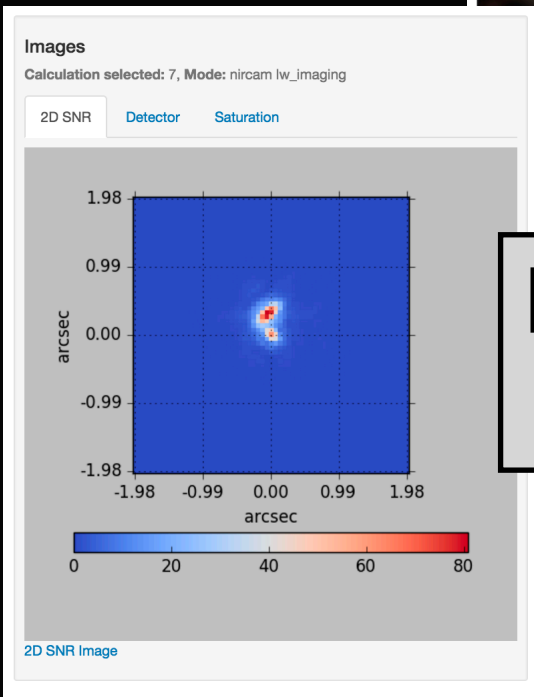


Calculations   Scenes and Sources   Uploaded Spectra

MIRI   NIRCam   NIRISS   NIRSpec

ID	Plot	Mode	Scene	(s)	SNR	
7	<input type="checkbox"/>	nircam lw_imaging	1	63.78	124.40	✓
6	<input type="checkbox"/>	nircam lw_imaging	1	63.78	191.76	✓
5	<input type="checkbox"/>	nirspec fixed_slit	1	458.40	125.73	✓
4	<input type="checkbox"/>	miri imaging	1	277.50	1163.14	✓
3	<input type="checkbox"/>	nircam lw_imaging	1	63.78	120.43	✓
2	<input type="checkbox"/>	nirspec fixed_slit	1	458.40	22.66	✓
1	<input type="checkbox"/>	nirspec fixed_slit	1	458.40	133.39	✓
-	-	---	-	--	--	-

JWST ETC



ETC WebApp Flight Release  
<https://jwst.etc.stsci.edu>

STScI | JWST Help Desk

JWST Help Desk Portal  
<https://jwsthelp.stsci.edu>

Welcome to the James Webb  
Space Telescope Help Desk



Request a MyST Account

Please register to gain full access to the James Webb Space Telescope Help Desk. Without an account you may still search the knowledge base but you will not be able to submit requests or questions.

Search Knowledge Base and JDOX





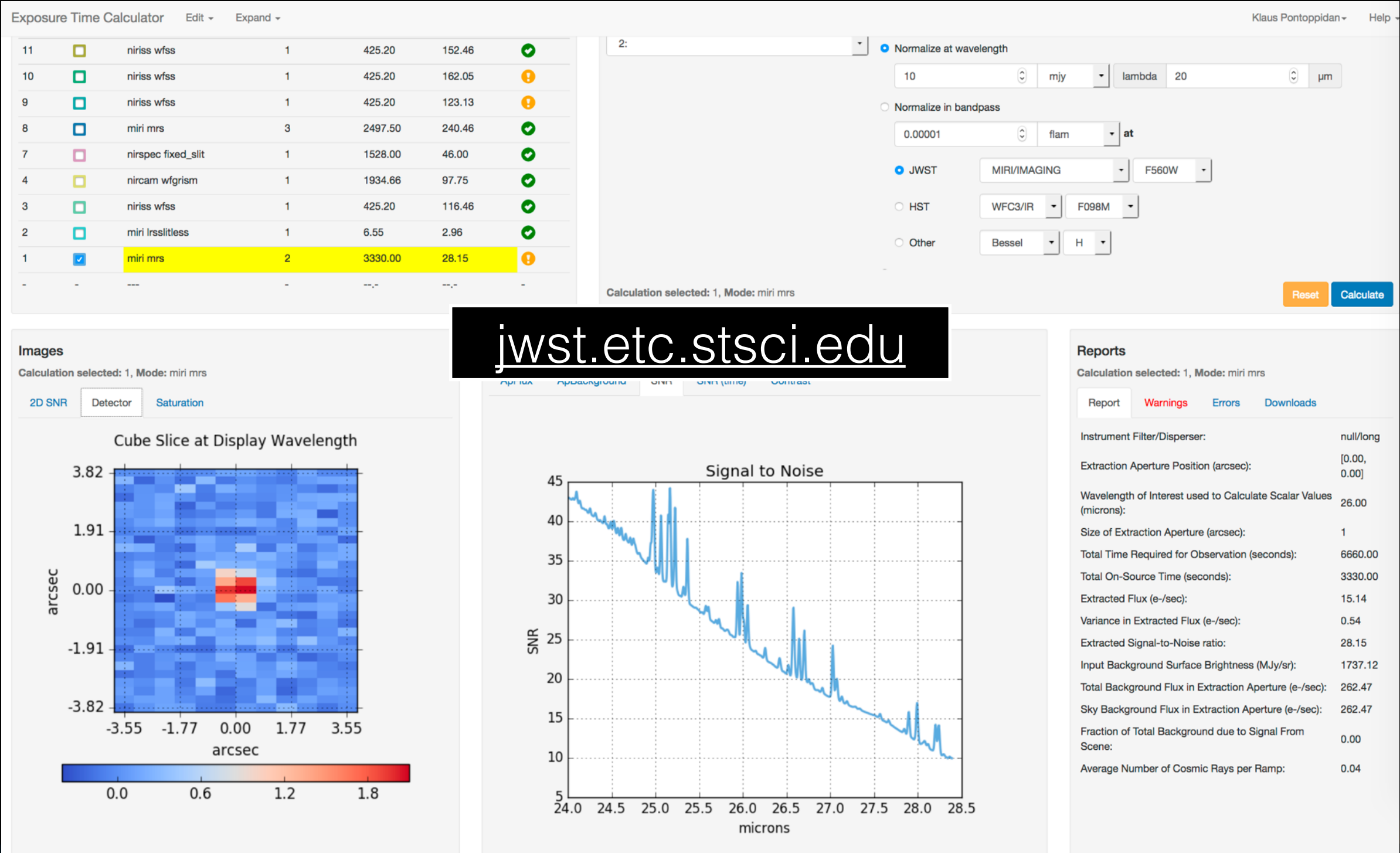
# The JWST Astronomer's Proposal Tool (APT)

- Familiar to HST users
- To be used to define JWST observing programs and submit JWST proposals.
- Development releases of JWST APT available together with HST APT

The screenshot displays the JWST APT software interface. The top menu bar includes options like 'Form Editor', 'Spreadsheet Editor', 'Orbit Planner', 'Visit Planner', 'View in Aladin', 'BOT', 'Target Confirmation', 'PDF Preview', 'Submission', 'Errors and Warnings', and 'Run'. A sidebar on the left shows a 'New Document' menu with options for 'New HST Proposal', 'New JWST Proposal', 'Proposal Information', 'Targets', 'Observations', and 'Observation Links'. The main window is titled 'Proposal Information of JWST Draft Proposal (Unsaved)'. It contains several input fields and checkboxes: 'Title' and 'Abstract' (both marked with a red 'X'), 'Proposal ID' (text field), 'Category' (dropdown menu set to 'GO'), 'Cycle' (dropdown menu set to '0'), 'Science Time (hours)' (text field set to '0.00'), 'Charged Time (hours)' (text field set to '0.00'), 'Proprietary Period' (dropdown menu set to 'Default'), 'Allow Restricted' (checkbox), and 'Scientific Category' (dropdown menu set to 'None Selected'). There are also checkboxes for 'Calibration' and 'Treasury', and buttons for 'Explain unschedulable observations', 'Request custom time allocation', and 'Future cycles'.

Download Latest Version at <http://apt.stsci.edu>

# JWST Exposure Time Calculator



Reports

Calculation selected: 1, Mode: miri mrs

Report

Warnings

Errors

Downloads

Instrument Filter/Disperser:

null/long

Extraction Aperture Position (arcsec):

[0.00, 0.00]

Wavelength of Interest used to Calculate Scalar Values (microns):

26.00

Size of Extraction Aperture (arcsec):

1

Total Time Required for Observation (seconds):

6660.00

Total On-Source Time (seconds):

3330.00

Extracted Flux (e-/sec):

15.14

Variance in Extracted Flux (e-/sec):

0.54

Extracted Signal-to-Noise ratio:

28.15

Input Background Surface Brightness (MJy/sr):

1737.12

Total Background Flux in Extraction Aperture (e-/sec):

262.47

Sky Background Flux in Extraction Aperture (e-/sec):

262.47

Fraction of Total Background due to Signal From Scene:

0.00

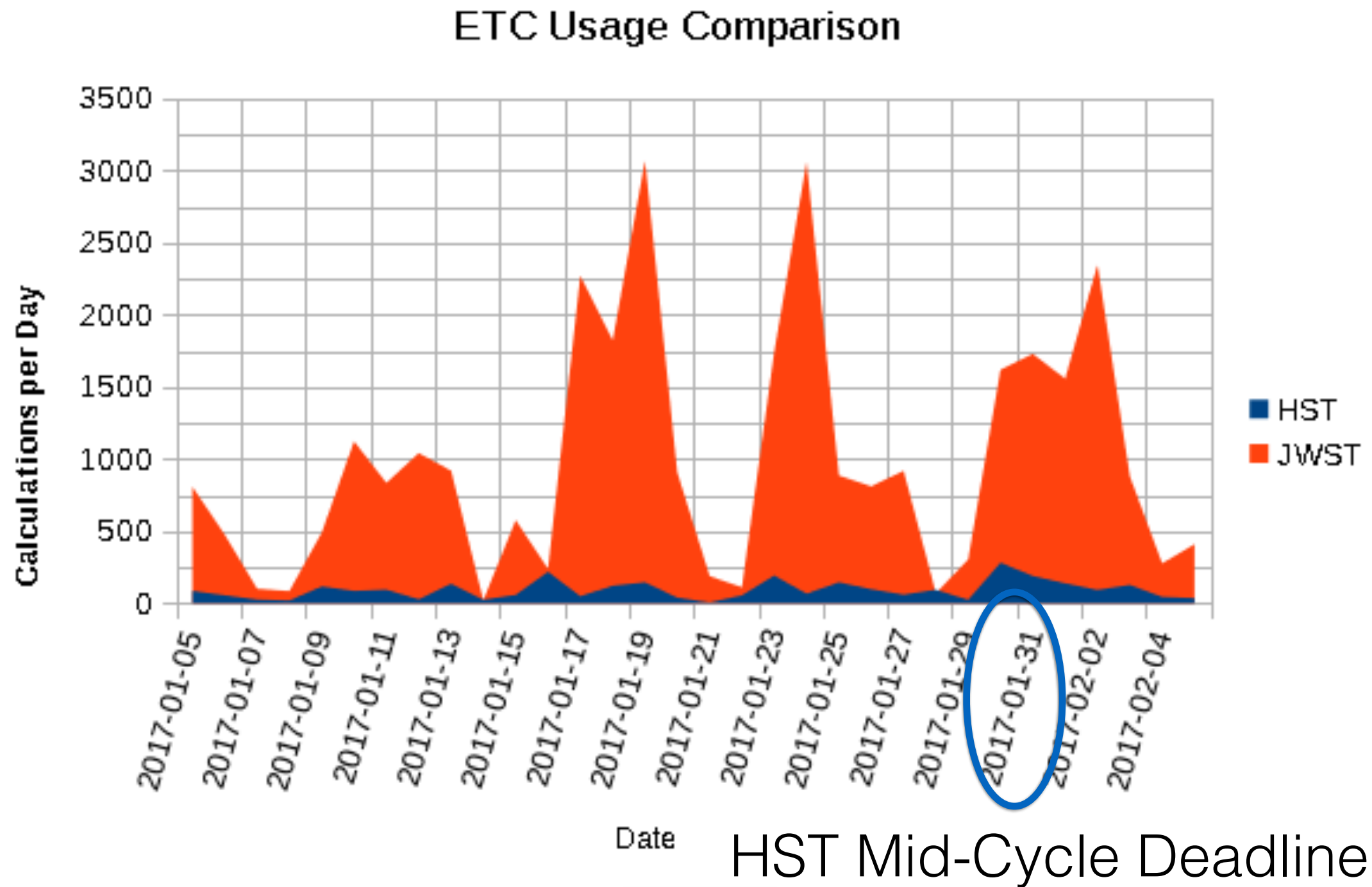
Average Number of Cosmic Rays per Ramp:

0.04

[jwst.etc.stsci.edu](http://jwst.etc.stsci.edu)



# JWST Exposure Time Calculator

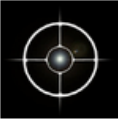


100,000+ Calculations since January 5th, 2017!

# JWST Help Desk


James Webb Help Desk

**APT Support**

 Request assistance with the Astronomer's Proposal Tool (APT)


[View Details](#)

**ETC Support**

 Request assistance with the Exposure Time Calculator (ETC)


[View Details](#)

**JWST Science Policies**

 Request assistance for Science Policy Issues.


[View Details](#)

**MAST Services**

 Information about the MAST Archive


[View Details](#)

**MIRI Support**

 Request assistance with the Mid-Infrared Instrument (MIRI)

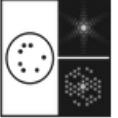
[View Details](#)

**NIRCam Support**

 Request assistance with the Near-Infrared Camera (NIRCam)

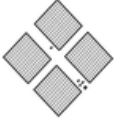
[View Details](#)

**NIRISS Support**

 Request assistance with the Near-Infrared Imager and Slitless Spectrograph (NIRISS)


[View Details](#)

**NIRSpec Support**

 Request assistance with the Near-Infrared Spectrograph (NIRSpec)


[View Details](#)

**Office of Public Outreach**

 Contact the STScI Office of Public Outreach about JWST


[View Details](#)

**Operations and Scheduling**

 Ask questions about scheduling and operations with JWST.


[View Details](#)

**Pipeline Support**

 Request assistance with the JWST pipeline


[View Details](#)

**WebbPSF / JWST Telescope**

 Request assistance with the WebbPSF tool or the Telescope optical system.

[View Details](#)

**JWST General Support**

 Request general JWST support for issues not covered by another category.

[View Details](#)



STScI | JWST Help Desk

Welcome to the James Webb Space Telescope Help Desk

[jwsthhelp.stsci.edu](http://jwsthhelp.stsci.edu)

160+ help tickets have already been received and resolved!

How can we help?

Search JWST Knowledge Base and Documentation System (JDOX)

How can we help?



Knowledge Base

Browse and search JWST Knowledge Base and Documentation (JDOX)



Get Help

Contact support to make a request, or report a problem



Community Forum

Community-sourced answers to your questions



# JWST User Documentation (JDox)

## A New Paradigm for JWST User Documentation

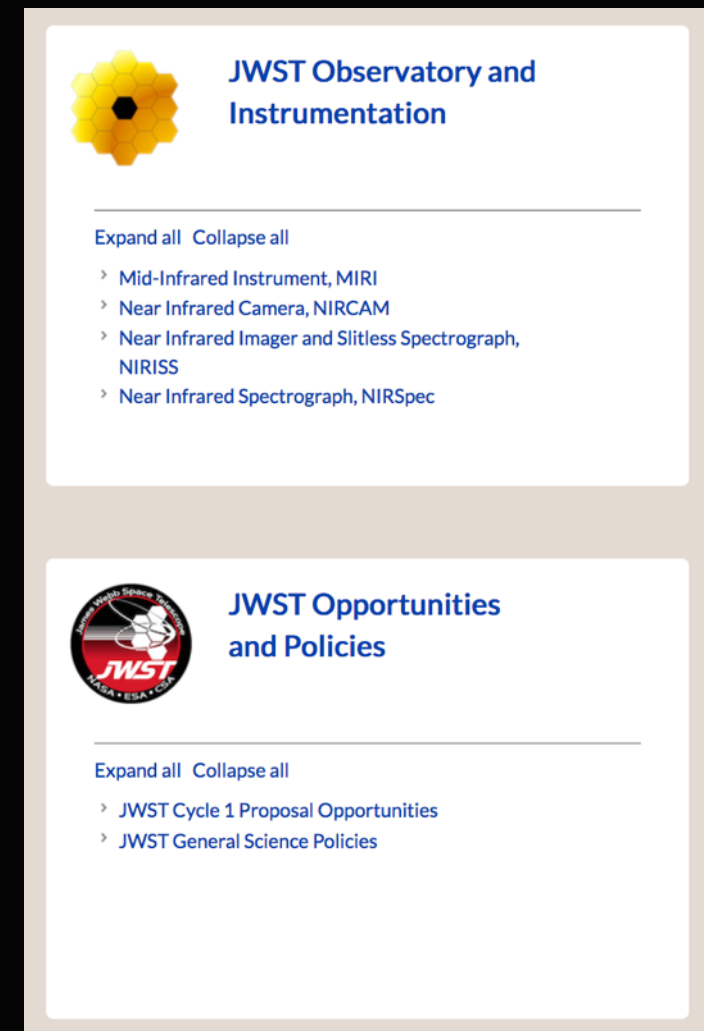
New documentation system: “Every page is page one”

- Short articles
- Self-contained, one-level information
- Hyperlinked network rather than monolithic handbook

Think Wikipedia (but it's not a wiki)

Multiple conceptual spaces: Background articles, planning cookbooks, science policy, engineering specs


Incremental releases (as articles are written and reviewed), beginning with instruments, APT, ETC articles



[jwst-docs.stsci.edu](http://jwst-docs.stsci.edu)

Over 230 pages published to date!

# JWST User Documentation (JDox)



James Webb Space Telescope User Documentation

HOMEINSTRUMENTS ▾PLANNING ▾CALL FOR PROPOSALS ▾POLICIES ▾DATA ▾


Search

... / MIRI Observing Modes

MIRI Low Resolution Spectroscopy

Last Updated Mar 22, 2017

Low-resolution spectroscopy is an observing mode for JWST's [Mid-Infrared Instrument \(MIRI\)](#) that offers slit and slitless spectroscopy from 5 to 12  $\mu\text{m}$ .

**MIRI**  
Mid-Infrared Instrument

## Introduction

MIRI's low-resolution spectrometer (LRS; [Kendrew et al. 2015](#)) offers both slit and slitless spectroscopy from 5 to 12  $\mu\text{m}$  using a [double prism](#) mounted in the MIRI [filter wheel](#), designed to provide a spectral resolving power of  $R = 40$  at 5  $\mu\text{m}$ , and  $R = 160$  at 10  $\mu\text{m}$  for compact sources ( $<2''$ ). The long-wavelength limit for this mode is determined by the combined throughput of the prisms and the slit mask, which drops off steeply from a peak of around 80% at 8–9  $\mu\text{m}$  to just 25% at 12  $\mu\text{m}$ . Point source [sensitivity](#) will be nearly a factor of 10 $\times$  better when using the slit.

Users should ultimately use the [Exposure Time Calculator](#) for all [sensitivity](#) calculations.

## On this page

- [Introduction](#)
- [Slit vs. slitless spectroscopy](#)
  - [Note on wide-field slitless spectroscopy while using the slit](#)
- [Dither patterns with LRS](#)
- [LRS exposure specifications](#)
- [Related links](#)
- [References](#)



# JWST Calls for Proposals/NOIs

JWST Opportunities and Policies

## JWST Cycle 1 Proposal Opportunities

The James Webb Space Telescope will offer proposal opportunities for General Observers (GO), **Guaranteed-Time Observers (GTO)**, and **Early Release Science Programs (DD ERS)** during Cycle 1. JWST Cycle 1 observations will commence in Spring 2019, with Cycle 1 proposals deadlines in 2017/2018.

We invite scientists to participate in the first cycle of investigations with the James Webb Space Telescope (JWST). JWST is an international collaboration between **NASA**, the **European Space Agency (ESA)**, and the **Canadian Space Agency (CSA)**. JWST is operated and managed by AURA's **Space Telescope Science Institute (STScI)**. The links below provide information, policies, deadlines, and instructions for proposing opportunities with JWST in Cycle 1.

- [Guaranteed Time Observation \(GTO\) Program \[PDF\]](#)
- [Director's Discretionary Early Release Science \(DD ERS\) Program \[PDF\]](#)
  - [Call for Notices of Intent to propose](#)
  - [Call for Proposals](#)
- General Observer (GO) and Archival Research (AR) Program

### Important Dates

Release of the Cycle 1 Call for GTO Proposals	January 6, 2017
Release of the Cycle 1 Call for ERS Letters of Intent	January 6, 2017
ERS Letters of Intent due	March 3, 2017
Cycle 1 GTO Science Descriptions and Observation Specifications due	April 1, 2017
Release of the Cycle 1 Call for ERS Proposals	May 19, 2017
APT version 25.2 Released (with final Cycle 1 overhead calculations)	June 1, 2017
GTO Observation Specifications Published (public)	June 15, 2017
GTO APT Technical Reviews and Revisions Begin	July 28, 2017
ERS Proposal Deadline	August 18, 2017
GTO APT Technical Reviews and Revisions End	September 15, 2017
ERS Results Released	November 2017
Release of the Cycle 1 Call for GO Proposals	November 30, 2017
GTO APT Files Published (public)	December 15, 2017
ERS APT Files Published (public)	December 2017
Cycle 1 GO Proposal Deadline	March 2, 2018

<https://jwst-docs.stsci.edu/display/JSP/JWST+Cycle+1+Proposal+Opportunities>

# The JWST Director's Discretionary Early Release Science (DD ERS) Program

*STScI Director Ken Sembach will allocate ~500 hours of Director's Discretionary time for Early Release Science (DD-ERS) to*

- accelerate the diffusion of JWST know-how, and*
- expand early opportunities for the community to gain experience with JWST data and scientific analysis.*

*Early resources are allocated to support up to 15 teams. Proposals will be selected in research areas spanning the science themes of JWST :*



*First Light &  
Reionization*



*Assembly of  
Galaxies*



*Birth of Stars &  
Protoplanetary  
Systems*



*Planets & Origins  
of Life*



200 Notices of Intent to Propose to Director's Discretionary Early Release Science (DD ERS) Program Received!



# The JWST Director's Discretionary Early Release Science (DD ERS) Program

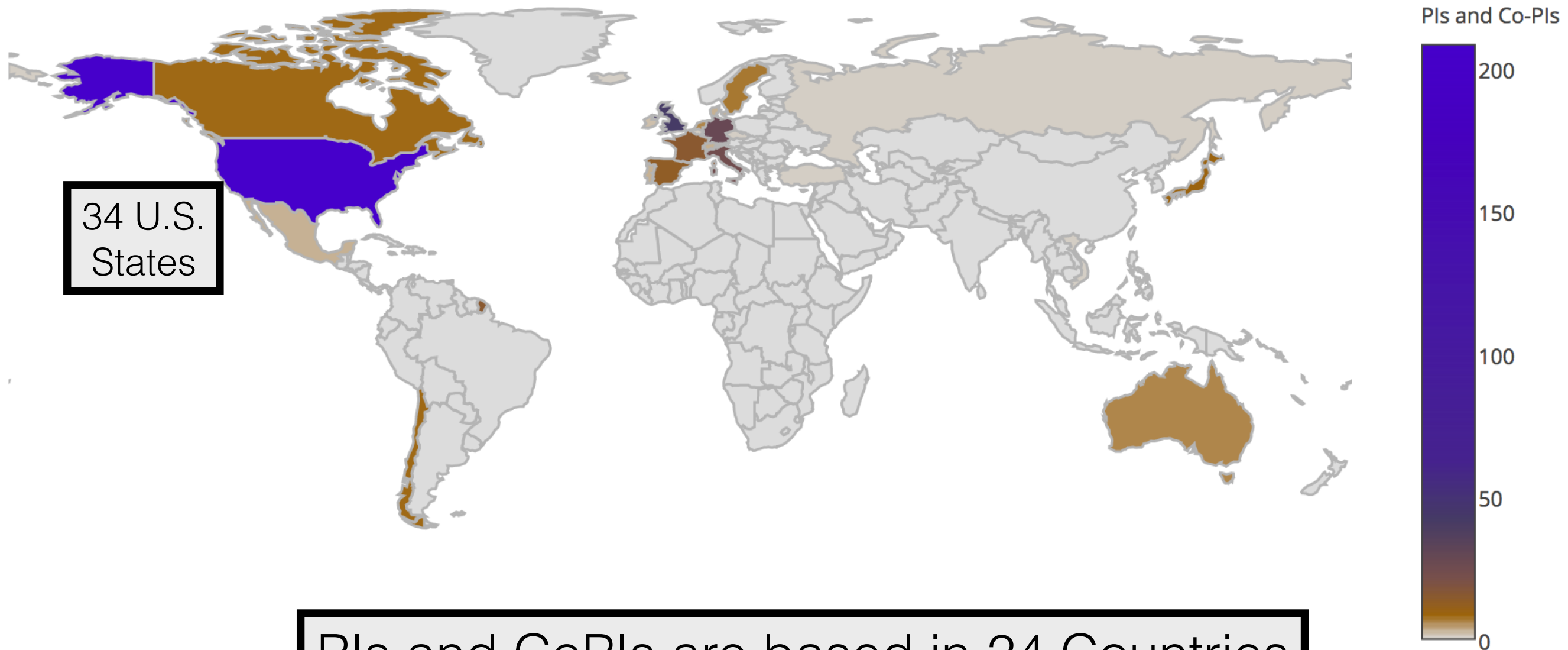
Total of 3,665 Named Investigators/Collaborators  
Average of 18 Scientists per Team  
Largest Team is 119 Investigators  
2,379 Unique Investigators/Collaborators  
477 New User Investigators/Collaborators



Image Credit: Northrop Grumman

# The JWST Director's Discretionary Early Release Science (DD ERS) Program

JWST Director's Discretionary Early Release Science Program: Notice of Intent PIs and Co-PIs

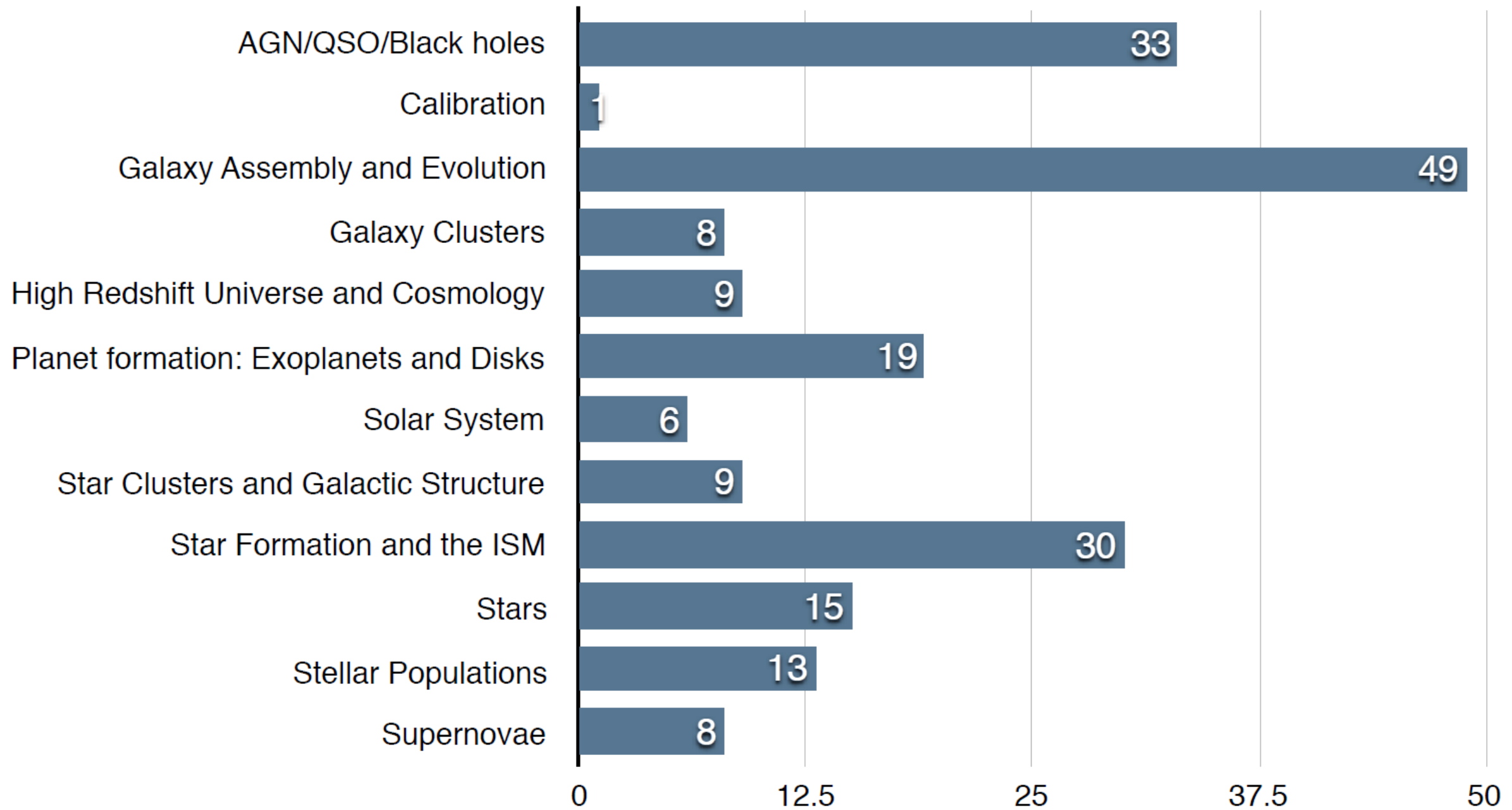


PIs and CoPIs are based in 24 Countries  
Interactive Map: <http://bit.ly/2m74cwX>

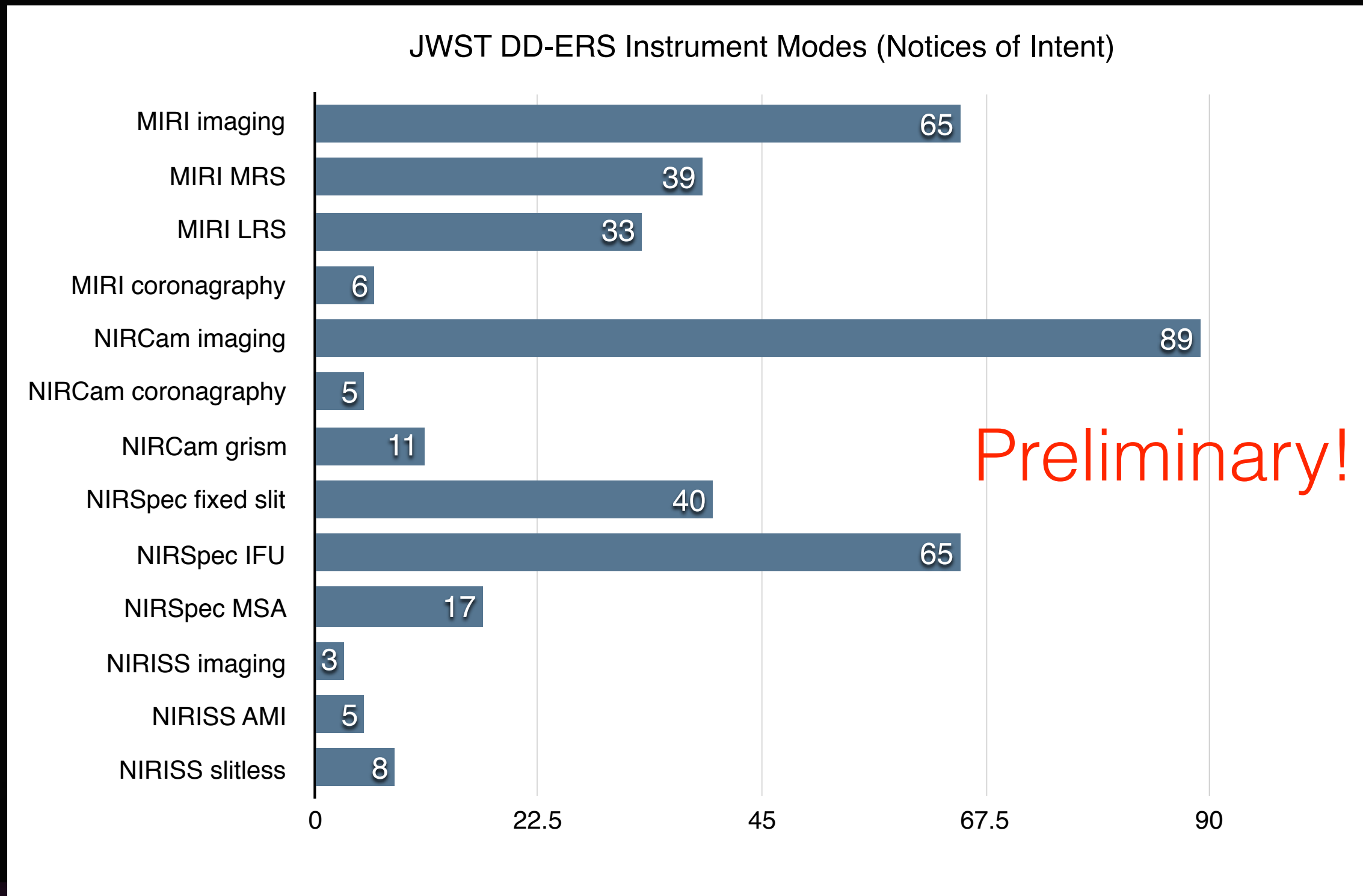


# The JWST Director's Discretionary Early Release Science (DD ERS) Program

JWST DD-ERS Science Categories (Notices of Intent)



# The JWST Director's Discretionary Early Release Science (DD ERS) Program





# Online Resources



[About STScI](#) | [Archive](#)

## NASA's James Webb Space Telescope

Developed in partnership with ESA and CSA. Operated by AURA's Space Telescope Science Institute

[PUBLIC](#) [EDUCATORS](#)

[JWST SCIENCE](#) ≡

[NEWS & EVENTS](#) ≡

[INSTRUMENTATION](#) ≡

[SCIENCE PLANNING](#) ≡

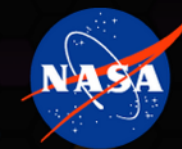
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The NASA James Webb Space Telescope, developed in partnership with ESA and CSA, is operated by AURA's Space Telescope Science Institute.

[jwst.stsci.edu](http://jwst.stsci.edu)



# Online Resources

## Proposal Planning Toolbox

Use these tools to craft a JWST proposal:

- The [Exposure Time Calculator \(ETC\)](#) calculates the detailed performance of the observatory by modeling astronomical scenes consisting of single or multiple point and extended sources. It offers full support for all of the JWST observing modes.
- The [Space Telescope Image and Spectroscopy Simulator \(STIPS\)](#) is used to simulate JWST observations of large astronomical fields.
- The [PSF Simulation Tool \(WebbPSF\)](#) is used to simulate detailed point spread functions for all the JWST instruments.
- The JWST project has two [Target Visibility Tools](#) to help you assess target visibilities before you enter information in APT.
- The [Astronomer's Proposal Tool \(APT\)](#) is used to write, validate and submit proposals for both the Hubble Space Telescope and the James Webb Space Telescope. [APT user documentation \(JDox\)](#) is also available to assist you in your proposal planning.
- The [simulated data sets](#) for NIRCам, NIRISS, NIRSpec, and MIRI will help you become familiar with the new JWST instruments.
- An overview of the [JWST sensitivities](#) is available.
- We also offer a handy [Pocket Guide](#) to all the JWST science modes.

**EXPOSURE TIME CALCULATOR** ☺  
(ETC)

**IMAGE AND SPECTROSCOPY  
SIMULATOR** ☺  
(STIPS)

**PSF SIMULATOR** ☺  
(WebbPSF)

**TARGET VISIBILITY TOOLS** ☺  
(GTVT and CVT)

**ASTRONOMER'S PROPOSAL TOOL** ☺  
(APT)  
[↗](#)

**SIMULATED DATA** ☺

[jwst.stsci.edu/science-planning/proposal-planning-toolbox](https://jwst.stsci.edu/science-planning/proposal-planning-toolbox)



# Online Resources

## This Month (April)

11						
Apr 2017						
Su	Mo	Tu	We	Th	Fr	Sa
9	10	11	12	13	14	15

**JWST Community Lecture Series – Wide-Field Slitless Spectroscopy with the James Webb Space Telescope (G. Brammer)**

April 11, 2017 11:00 AM EDT - April 11, 2017 12:00 PM EDT • Baltimore STScI Muller Auditorium

Abstract: I will review the wide-field slitless spectroscopic (WFSS) capabilities of the JWST instruments NIRISS and NIRCам. Using a grism element and no slits, JWST WFSS will probe parameter space intermediate between standard imaging and IFU and multi-object spectroscopy observing modes, providing uniform spectra of large, unbiased samples of stars and galaxies that can be used to measure spectral...

25						
Apr 2017						
Su	Mo	Tu	We	Th	Fr	Sa
23	24	25	26	27	28	29

**JWST Community Lecture Series – The JWST Calibration Pipeline (H. Bushouse)**

Community Lecture • April 25, 2017 11:00 AM EDT - April 25, 2017 12:00 PM EDT • Baltimore STScI Muller N420

Abstract: The JWST calibration pipeline is a modular, flexible collection of processing steps and pipelines that are used to remove detector artifacts, calibrate, and reduce data from all JWST instruments and provide products that are ready for scientific analysis. Unlike the HST calibration pipelines, which were very instrument-specific and mostly monolithic in nature, the JWST calibration pipelines...

## Workshops & Lectures

More than 15 events to learn more about JWST before end of 2017!

Use the links below to learn about JWST workshops and lectures to prepare you for the ERS and GO Cycle 1 proposal deadlines and the overall JWST mission.

**WORKSHOPS** ➔

**COMMUNITY LECTURE SERIES** ➔

# JWST@230th AAS

## Preparing for JWST Observations

**230th AAS Meeting-in-a-Meeting  
June 5th-8th**

Opportunities to propose Early Release Science (ERS) observations for the James Webb Space Telescope (JWST) are now available. JWST General Observer (GO) program opportunities will be available in just a few months (November 2017). How can you prepare a successful JWST observing program? Science Instrument team members and other JWST experts will describe how to turn science ideas into JWST observing programs, including JWST proposal planning tool use case examples.

### **Session I (Monday June 5th, 2:00pm-3:30pm)**

Preparing for JWST Observations: Insights from First Light and Assembly of Galaxies GTO Programs I

### **Session II (Tuesday June 6th, 10:00am-11:30am)**

Preparing for JWST Observations: Insights from First Light and Assembly of Galaxies GTO Programs II

### **Session III (Tuesday June 6th, 2:00pm-3:30pm)**

Preparing for JWST Observations: Insights from Birth of Stars and Protoplanetary Systems GTO Programs

### **Session IV (Wednesday June 7th, 10:00am-11:30am)**

Preparing for JWST Observations: Insights from Exoplanet, Debris Disk, and Brown Dwarf GTO Programs I

### **Session V (Wednesday June 7th, 2:00pm-3:30pm)**

Preparing for JWST Observations: Insights from Exoplanet, Debris Disk, and Brown Dwarf GTO Programs II

### **Session VI (Thursday June 8th, 10:00am-11:30am)**

Preparing for JWST Observations: Insights from Solar System GTO Programs

Registration Deadline is  
May 11th, 2017



**JWST at 230th AAS**

June 4 - 8, 2017 • Austin, TX

**JWST Proposal Planning Workshop**  
Sunday, June 4, 2017  
8:30 am - 5:00 pm

**Preparing for JWST Observations**  
230th AAS Meeting-in-a-Meeting  
June 5 - 8, 2017

In this six-session Meeting-in-a-Meeting, Science Instrument Team members and other JWST experts will describe how to turn science ideas into JWST observing programs, including JWST proposal planning tool case examples. Topical sessions will span high-redshift galaxies to the Solar System and everything in between. Contributed posters on anything and everything JWST are encouraged!

**Invited Speakers**

- Eric Smith (NASA HQ)
- Marcia Rieke (U Arizona)
- George Rieke (U Arizona)
- Rogier Windhorst (ASU)
- Macarena Garcia Marin (ESA)
- Pierre Ferruit (ESA)
- Swara Ravindranath (STScI)
- Michael Meyer (U. Michigan)
- Guido de Marchi (ESA)
- Margaret Meixner (STScI)
- Doug Johnstone (HIA)
- Fred Lahuis (SRON)
- Laurent Pueyo (STScI)
- Chas Beichman (NexSci)
- Stephan Birkmann (ESA)
- Tom Greene (NASA Ames)
- Nikole Lewis (STScI)
- Jacob Bean (U Chicago)
- David Lafreniere (UdeM)
- Andy Rivkin (JHU/APL)
- Noemi Pinilla-Alonso (UCF)
- Glenn Orton (JPL)
- Geronimo Villanueva (NASA GSFC)

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